U.S. Department of Energy
Office of River Protection
P.O. Box 450
Richland, Washington 99352

02-OSR-0509

Mr. R. F. Naventi, Project Manager
Bechtel National, Inc.
3000 George Washington Way
Richland, Washington 99352

Dear Mr. Naventi:

CONTRACT NO. DE-AC27-01RV14136 – REVIEW DEFERRAL OF AUTHORIZATION BASIS CHANGE NOTICE (ABCN) 24590-WTP-ABCN-ESH-02-023, REVISION 0, MODIFICATION OF THE RADIOLOGICAL EXPOSURE STANDARDS

Reference: BNI letter from A. R. Veirup to M. K. Barrett, ORP, "Authorization Basis Change Notice 24590-WTP-ABCN-ESH-02-023, Revision 0, Modification of the Radiological Exposure Standards," CCN-038773, dated September 5, 2002.

This letter informs Bechtel National, Inc. (BNI) that the U.S. Department of Energy (DOE), Office of River Protection (ORP) has deferred review of ABCN 24590-WTP-ABCN-ESH-02-023 pending additional justification of the proposed change by BNI. The additional justification should address what (if any) design basis events are impacted and justify several statements made in the ABCN. The enclosure identifies those statements where additional justification is required. Discussions with your staff indicate the justification is under development and the substantially revised ABCN will be resubmitted in the near future. Upon receipt of the revised ABCN, we will resume review of the document.

If you have any questions, please contact me, or your staff may call Jeanie Polehn, Safety Regulation Division, (509) 372-0787.

Sincerely

Roy J. Schepens
Manager

OSR:JLP

Enclosure

Authorization Basis Change Notice (ABCN)
24590-WTP-ABCN-ESH-02-023, Rev. 0

The Office of River Protection (ORP) has two main objections to the ABCN[1]:

A. The basis for needing the ABCN was not adequately explained.

B. The justification for the ABCN was not adequately documented.

Details of each objection is documented below.

A. Basis for Needing the ABCN was Not Adequately Explained.

The Contractor has not adequately explained why the authorization basis change is needed as required by the ABCN, Section II, Item G. The ABCN did not provide any examples of Design Basis Event (DBE) analyses where the 25 rem Radiological Exposure Standards[2] (RES) in Safety Criterion 2.0-1, Table 2-1 were challenged and where changing the RES to 100 rem/event for extremely unlikely events would result in significant cost savings. The ABCN did not identify what important-to-safety (ITS) structures, systems, and components (SSCs) were impacted. Attachment 3 of the ABCN, Page 3, Section 3.8.1 stated, "These values (exposure values in the RES table) were set very conservatively in order to ensure the facility risk goals are met; however, design evolution and ISM iteration have identified that there may be overly conservative design requirements as a result of the conservative values selected in the RES table." The ABCN did not provide the documented optimization to justify the statement. Given that the methodology for calculating radiological exposures for DBEs has such large uncertainties associated with it, especially for very low frequency events, ORP questions the need for changing the RES table.

1. If there are DBEs that challenge the 25 rem RES value, then the Contractor should first try to recalculate the radiological exposure values by using more realistic input parameters.

2. The Contractor should document the optimization that justifies the statement, "Design evolution and ISM iteration have identified that there may be overly conservative design requirements as a result of the conservative values selected in the RES table."

3. If after refining the radiological exposure values, the 25 rem RES value is still challenged and optimization demonstrates that the cost of ITS SSCs to meet the 25 rem RES value is not as low as reasonably achievable, then the Contractor may be justified in requesting a change to the RES for facility workers for extremely unlikely events. The Contractor should identify what DBEs and ITS SSCs are impacted.

[1] 24590-WTP-ABCN-ESH-02-023, "Modification of the Radiological Exposure Standards," Rev. 0, dated September 5, 2002.
[2] Safety Requirements Document (SRD), Volume 2, 24590-WTP-SRD-ESH-01-001-02, Rev 1, Bechtel National, Inc., June 2002.

B. Areas Where Justification for ABCN was Not Adequately Documented.

1. The ABCN did not identify Nuclear Regulatory Commission (NRC) licensing impacts associated with changing the RES table value for the co-located worker from 25 rem to 100 rem for extremely unlikely events. Since the River Protection Project Waste Treatment and Immobilization Plant (WTP) is a new facility, it may be licensed by the NRC in the future. One significant difference between NRC regulations and the WTP Contract requirements (Contract No. DE-AC27-01RV14136) is the contract classifies individuals located outside the contractor-leased property as co-located workers if they are located within the Hanford Site boundary. This classification is consistent with current practices and nomenclature used at Hanford and other DOE sites. NRC regulations do not include provisions for individuals to be classified as co-located workers. The NRC limits doses to individuals at the controlled area boundary[3] (considered "members of the public") from accidents to less than or equal to 25 rem TEDE, based on 2-hour duration of exposure. Although ORP did not make a direct comparison between NRC regulations and the RES table due to significant differences in definitions and application of the accident dose limits, the WTP may not comply with NRC licensing requirements if the RES for co-located workers is changed to 100 rem/event.

2. The ABCN submittal referenced a letter from Klein to Thomson[4] as the main basis for the ABCN; changes to the RES table provided consistency with the radiological exposure standards used at the Hanford Site and other sites in the DOE complex. The ABCN, Section II, Item G states, "The proposed change to the radiological exposure standards provides better consistency between the WTP Project and other sites in the DOE Complex (including the Hanford Site) with regard to radiological exposure standards for workers under accident conditions." However, the ABCN did not provide any justification for how the WTP Project is inconsistent with other sites in the DOE Complex. No references were made to risk assessment methodologies and radiological exposure standards used at other sites in the DOE complex so that ORP can make a direct comparison between the proposed changes and requirements for other DOE sites.

   Also, the ABCN did not adequately explain why the Klein letter is relevant for the new WTP facilities that will operate for the next 50 years. The referenced Klein letter to Thomson stated "This strategy provides a path to transition the safety basis for the various Hanford facilities from support of operation and stabilization missions through D&D to accelerate closure." The Klein letter provided a logical nuclear safety strategy for implementing the 10 CFR 830, "Nuclear Safety Management," Rule revision at existing Hanford facilities. The Klein letter states, "This approach (the nuclear safety strategy) will reduce the total number of safety basis documents that must be developed and maintained to support the remaining mission and closure of the Hanford Site …."

[3] "controlled area boundary" is defined in 10 CFR 72.106 to mean the area surrounding the facility over which the licensee exercises authority over its use.
[4] RL letter from K. A. Klein to E. K. Thomson, FHI, "Fluor Hanford Nuclear Safety Basis Strategy and Criteria," 02-ABD-0053, dated February 5, 2002.

10 CFR 830 imposes different safety basis requirements in Subpart B for new versus existing facilities[5]. Klein directed Fluor Hanford, Inc. to prepare exemption requests for facilities that have no remaining operational mission, are in long-term surveillance and maintenance, and where Rule-compliance with existing safety basis documentation is not practical; this approach would not be allowed per 10 CFR 830 for new facilities. Many of the facilities referenced in the Klein letter were built in excess of 40 years ago to very different safety basis standards. The facility life cycle stages for the existing Hanford facilities (e.g., expedite transition to decontamination and decommissioning) are very different from the WTP (i.e., design and construct a facility that can be commissioned).

Note that the Klein letter contains values in excess of those ever allowed by the WTP, for "prompt death to a facility worker" under High Consequence and for Emergency Risk Planning Guideline (ERPG) values.

3. The ABCN, Attachment 3, Page 6, Section 3.8.1.6, "Implementation Plan for Alternative Approach" stated, "After the RES table has been revised, a review of the design and equipment will be performed to determine if changes to the design need to be made. It is anticipated that design requirements for some SSCs may be relaxed." The ABCN should identify the ITS SSCs that will be impacted (and therefore require changes to the Preliminary Safety Analysis Reports) as part of the ABCN request.

4. The ABCN did not identify how the proposed changes in RES table values are consistent with Defense Nuclear Facilities Safety Board expectations and with international standards and recommendations. Given that the International Commission on Radiological Protection (ICRP)[6] has lowered its recommended dose limits for facility workers from 5 rem total effective dose equivalent (TEDE) per year to 2 rem per year averaged over 5 years with a maximum of 5 rem per year TEDE, the ABCN does not appear to be consistent with the lowering of international recommendations to lower dose limits.

5. No justification was provided for the following in the ABCN:

   - Section II, Item F; "No associated ABCNs or AB documents are impacted by the ABCN." Does this mean that not a single DBE analysis in the Preliminary Safety Analysis Report is affected? How can a change to the determination of SL-1 and SL-2 events not affect the identification of ITS SSCs as Safety Design Class and Safety Design Significant? Does this not affect the requirements on single failure prevention and physical barriers?

   - Section III, Item K, "The use of a 100 rem standard for very low frequency events does not compromise worker safety."

   - Section III, Item K, "The WTP risk goals are maintained."

[5] An existing DOE nuclear facility is one that is or has been in operation prior to April 9, 2001.
[6] International Commission on Radiation Protection (ICRP) 60, *1990 Recommendations of the International Commission on Radiological Protection*, Volume 21, Numbers 1 through 3, 1991.

- Section III, Item K, “The revised derived values in the RES table are not significant to the overall risk of the workers as discussed above.”

- A factor of 4 change in the RES values for extremely unlikely events given the overall uncertainty in dose estimation.